Henry Lake

Steuben County

Supplemental Evaluation - 2010

Date of Survey: June 9-10 and August 17, 2010

Biologist: Larry Koza

Objectives: Henry Lake was sampled as part of Division of Fish and Wildlife (DFW) Work Plan 300FW1F10D43642, Glacial Lakes Status and Trends, the objective of which is to develop a quantifiable protocol that describes the status of glacial lake fish communities relevant to their condition and factors that affect that condition. Henry Lake serves as one lake among a sample size of 60 lakes involved in the first five years of this study. Lakes are grouped into one of five clusters based on several variables. Fish habitat and fish community data will be collected from each cluster and a database will be developed to explore relationships between similar lake types. This is the first fish community survey ever conducted at Henry Lake by DFW biologists.

Methods: This survey was conducted on June 9 and 10, 2010. Water temperature and dissolved oxygen were measured throughout the water column. Water clarity was also measured along with pH, alkalinity and conductivity. Submersed aquatic vegetation was sampled on August 17, 2010 using methods outlined in the Tier II Aquatic Vegetation Survey Protocol developed by the DFW Lake and River Enhancement Program and used in their aquatic vegetation control grant program. Four zooplankton tows were also conducted on both June 9 and August 17. A global positioning system (GPS) device was used to record the location of the limnological data collection site, aquatic vegetation sample sites, and fish collection sites. Fish were collected by pulsed D.C. electrofishing the shoreline at night with two dippers for 30 minutes. Two trap nets and two experimental-mesh gill nets were also fished overnight for one night. All fish collected were measured to the nearest 0.1 in TL and four weights per tenth inch group were taken to the nearest 0.01 pound. Five scale samples per half-inch group were collected from game species for age and growth analysis.

Summary: The Secchi disk reading in June was 4.5 feet while dissolved oxygen levels were ample for fish survival down to a depth 11 feet. Thirty sites were randomly sampled during the plant survey, 28 of which fell within the littoral zone in water 9 feet in depth or less. A total of four native species were identified. Aquatic plants were observed at 23 of the 28 littoral sites sampled. The maximum number of plant species found at one site was four and the mean was two. Coontail was the dominant plant collected. Eurasian watermilfoil, an exotic invasive species, was the next most common species collected followed by sago pondweed. One additional exotic invasive species, curlyleaf pondweed, was also collected during the survey and was found at three of the sample sites. Three emergent, floating or floating leaf plants associated with wetlands, cattails, spatterdock and white water lily, were also observed. Eurasian watermilfoil was concentrated on the south end of the lake, near the inlet. It does not currently present serious impairment of boating or angling activity in the lake. In the past, the Big Turkey Lake home owners have paid for chemical control of the milfoil in Henry Lake due to the fact Big Turkey Lake is connected to Henry Lake by Mud Creek. The creek serves as the outlet for Henry Lake and is navigable by small boat. Since Henry Lake is located upstream of Big Turkey Lake, downstream migration of any milfoil fragments would be counter-productive to efforts to control the spread of the plant in Big Turkey.

Zooplankton samples in both June and August were dominated by daphnia (72.5% and 47% respectively). Calanoida copepods were the second most prevalent zooplankton in the August survey (24%) while cyclopodia ranked second in June (12%). Of the remaining species collected, bosminidae represented the greatest presence at 8% in June.

A total of 145 fish representing 11 species was collected from Henry Lake in 2010. Numerically, bluegill was the top species collected (68%) followed by largemouth bass (16%). White sucker was the dominant species collected by weight (30.5%) followed by largemouth bass (29%) and bluegill (22%). Bluegills from 2.5 to 8.3 in TL were collected and harvestable size fish (6 in TL or larger) comprised 55% of the catch. Approximately 18% measured 7 in TL or larger. Bluegill electrofishing catch (190/hr) was below average (400/hr). Twenty-three largemouth bass were collected during the survey. Only two were legal-size (≥14 in TL) with the largest measuring 20.8 in TL. The electrofishing catch rate for bass (42/hr) was also below average (100/hr). Bluegills grew at an average rate for northern Indiana natural lakes as did age-3 and older bass, while age-1 and age-2 bass grew at an above average rate. Other major sport

fish collected included three yellow perch, two walleyes and one black crappie. The walleye, which measured 22.0 and 25.5 in TL, undoubtedly migrated into the lake from Big Turkey Lake whose residents have conducted private walleye stockings for a number of years.

Recommendation: There is no fish management recommended for Henry Lake at this time. Residents of Big Turkey Lake should be encouraged to continue control of Eurasian watermilfoil in Henry Lake in order to increase the effectiveness of their own milfoil control program.

Submitted by: Larry A. Koza, Fisheries Biologist
Date: 2/21/11

Approved by: Stu Shipman, North Region Fisheries Supervisor
Date: 2/28/11

SAMPLING EFFORT

ELECTROFISHING	Day hours: 0		Night hours: 0.5		Total hours: 0.5
TRAP NETS	Number of traps: 2		Number of Lifts: 1		Total effort: 2
GILL NETS	Number of nets: 2		Number of Lifts: 1		Total effort: 2
ROTENONE	Gallons: 0	ppm: 0	Acre Feet Treated: 0	SHORELINE SEINING	Number of 100 Foot Seine Hauls: 0

PHYSICAL AND CHEMICAL CHARACTERISTICS

Color: Brown	Turbidity: 4 Feet 6 Inches (SECCHI DISK)
Alkalinity (ppm)* Surface: 154.4 Bottom: 171.6	pH Surface: 9.2 Bottom: 9.0
Conductivity: 510 micromhos	Air temperature: 74 ℉
Water chemistry GPS coordinates: N 41.57069	W -85.17778

TEMPERATURE AND DISSOLVED OXYGEN (D.O.)

DEPTH (FEET)	Degrees (℉)	D.O. (ppm)	DEPTH (FEET)	DEGREES (℉)	D.O. (ppm)	DEPTH (FEET)	DEGREES (℉)	D.O. (ppm)
SURFACE	67.6	9.0	36			72		
2	67.0	8.7	38			74		
4	64.8	7.0	40			76		
6	63.0	6.5	42			78		
8	60.6	6.3	44			80		
10	55.9	4.4	46			82		
12	53.3	2.6	48			84		
14	51.4	0.9	50			86		
16	49.5	0.1	52			88		
18	48.6	0.1	54			90		
20	47.7	0.1	56			92		
22	47.1	0.1	58			94		
24	47.0	0.1	60			96		
26			62			98		
28			64			100		
30			66					
32			68					
34			70					

COMMENTS

*ppm-parts per million

SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT					
*COMMON NAME OF FISH	NUMBER	PERCENT	LENGTH RANGE (inches)	WEIGHT (pounds)	PERCENT
Bluegill	99	68.3	2.5 - 8.3	15.69	21.9
Largemouth bass	23	15.9	6.3 - 20.8	20.64	28.8
White sucker	12	8.3	12.3 - 19.7	21.79	30.5
Yellow perch	3	2.1	4.6 - 7.6	0.40	0.6
Walleye	2	1.4	22.0 - 25.5	8.31	11.6
Black crappie	1	0.7	8.7	0.35	0.5
Golden redhorse	1	0.7	18	2.19	3.1
Golden shiner	1	0.7	19.5	0.32	0.4
Pumpkinseed	1	0.7	5.4	0.12	0.2
Spotted sucker	1	0.7	16.2	0.43	0.6
Yellow bullhead	1	0.7	12.8	1.31	1.8
Total (11 Species)	145			71.55	

*Common names of fishes recognized by the American Fisheries Society.

**Less than 0.1 percent

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF BLUEGILL									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5	2	2.0	0.02	1,2	20.5				
3.0					21.0				
3.5	4	4.0	0.04	3	21.5				
4.0	6	6.1	0.05	3	22.0				
4.5	8	8.1	0.07	3,4	22.5				
5.0	7	7.1	0.10	3,4	23.0				
5.5	18	18.2	0.12	4,5	23.5				
6.0	18	18.2	0.16	4	24.0				
6.5	18	18.2	0.21	3,4,5	24.5				
7.0	11	11.1	0.26	5	25.0				
7.5	4	4.0	0.33	5	25.5				
8.0	3	3.0	0.30	5,6	26.0				
8.5					TOTAL	99			
9.0									
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	190/hr	GILL NET CATCH	2/lift	TRAP NET CATCH	1/lift

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF LARGEMOUTH BASS									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0	1	4.3	5.52	8
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0					22.0				
4.5					22.5				
5.0					23.0				
5.5					23.5				
6.0	1	4.3	0.10	1	24.0				
6.5	1	4.3	0.11	1	24.5				
7.0					25.0				
7.5					25.5				
8.0					26.0				
8.5					TOTAL	23			
9.0	3	13.0	0.32	2					
9.5	2	8.7	0.38	2					
10.0	2	8.7	0.50	3					
10.5	1	4.3	0.51	3					
11.0	1	4.3	0.66	3					
11.5	4	17.4	0.75	3,4					
12.0	2	8.7	0.77	3,4					
12.5									
13.0	2	8.7	1.03	4					
13.5	2	8.7	1.16	5					
14.0									
14.5									
15.0									
15.5									
16.0	1	4.3	2.11	7					
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	42/hr	GILL NET CATCH	1/lift	TRAP NET CATCH	0/lift

AGE-LENGTH KEY FOR BLUEGILL														
LENGTH GROUP (inches)	NUMBER COLLECTED	NUMBER AGED	AGE											
			1	2	3	4	5	6	7	8	9	10	11	12
2.5	2	2	1	1										
3.5	4	4			4									
4.0	6	5			6									
4.5	8	5			5	3								
5.0	7	5			1	6								
5.5	18	5				11	7							
6.0	18	6				18								
6.5	18	5			4	7	7							
7.0	11	5					11							
7.5	4	4					4							
8.0	3	3					2	1						
Total	99	49	1	1	20	45	31	1						
Mean TL			2.5	2.8	4.8	6.0	6.9	8.3						
SE					0.23	0.08	0.14							

AGE-LENGTH KEY FOR LARGEMOUTH BASS														
LENGTH GROUP (inches)	NUMBER COLLECTED	NUMBER AGED	AGE											
			1	2	3	4	5	6	7	8	9	10	11	12
6.0	1	1	1											
6.5	1	1	1											
7.5	3	3		3										
8.0	2	2		2										
8.5	2	2			2									
9.0	1	1			1									
9.5	1	1			1									
10.0	4	3			3	1								
10.5	2	2			1	1								
11.5	2	2				2								
12.0	2	2					2							
13.0	1	1							1					
14.5	1	1								1				
Total	23	22	2	5	8	4	2		1	1				
Mean TL			6.5	9.5	11.2	12.6	13.8		16.3	20.8				
SE			0.25	0.12	0.28	0.36								

OCCURRENCE AND ABUNDANCE OF SUBMERSED AQUATIC PLANTS						
Lake: Henry	Total Sites: 30			Mean species/site: 1.57		
County: Steuben	Sites with plants: 23			SE Mean species/site: 0.22		
Date: 8/17/2010	Sites with native plants: 19			Mean native species/site: 1.13		
Secchi (ft): 4.0	Number of species: 6			SE Mean natives/site: 0.19		
Maximum Plant Depth (ft): 9.0	Number of native species: 4			Species diversity: 0.74		
Trophic Status: E	Maximum species/site: 4			Native species diversity: 0.60		
Species	**Frequency of Occurrence**	**Rake score frequency per species**				**Plant Dominance**
		0	**1**	**3**	**5**	
Coontail	63.3	36.7	16.7	20.0	26.7	42.0
Eurasian watermilfoil	33.3	66.7	30.0	3.3	0.0	8.0
Sago pondweed	30.0	70.0	13.3	10.0	6.7	15.3
Flatstem pondweed	13.3	86.7	10.0	3.3	0.0	4.0
Curlyleaf pondweed	10.0	90.0	10.0	0.0	0.0	2.0
Eel grass	6.7	93.3	6.7	0.0	0.0	1.3

Emergent species noted: cattails, spatterdock and white waterlily